Lower 900 MHz Spectrum Utilization

The 902 to 928 MHz frequency range, also known as the ISM (Industrial, Scientific, and Medical) band, is used by many industries due to its suitability for wireless communication. The following is a sample of industries and organizations that utilize this frequency range in varied applications.

Transportation:

Verizon Connect: Provides fleet management solutions that use the 900 MHz band for vehicle tracking and telematics. Their system, Reveal, collects data on vehicle location, speed, and driver behavior, helping companies optimize fleet operations and improve safety.

a. **Werner Enterprises**: Uses Verizon Connect for fleet management to track trucks, monitor driver behavior, and optimize routes, ensuring timely deliveries and efficient operations.

b. **Knight-Swift Transportation**: Employs Verizon Connect to enhance fleet visibility, improve safety, and ensure compliance with regulatory requirements.

c. **YRC Worldwide**: Utilizes Verizon Connect for real-time tracking of freight shipments, managing driver hours, and improving overall operational efficiency.

d. **Duke Energy**: Utilizes Verizon Connect for fleet management, tracking service vehicles, and ensuring efficient dispatch of crews for maintenance and emergency responses.

e. **Southern California Edison**: Implements Verizon Connect solutions to monitor the location and status of utility trucks, optimizing field operations and improving service reliability.

f. **PG&E** (Pacific Gas and Electric Company): Uses Verizon Connect to manage its fleet of service vehicles, enhancing operational efficiency and response times.

g. **Caterpillar**: Uses Verizon Connect for asset tracking and monitoring of heavy equipment, ensuring optimal utilization and maintenance of machinery on construction sites.

h. **John Deere**: Employs Verizon Connect solutions to track and manage its fleet of construction and agricultural equipment, improving operational efficiency and reducing downtime.

i. **Komatsu**: Implements Verizon Connect for monitoring the location and performance of heavy machinery, enhancing productivity and maintenance planning.

j. **First Student**: Uses Verizon Connect for tracking school buses, ensuring student safety, optimizing routes, and improving communication with parents and schools.

k. **Greyhound**: Employs Verizon Connect solutions to monitor the location and status of buses, enhancing passenger safety and ensuring timely service.

l. **Metro Transit**: Utilizes Verizon Connect to track transit buses, provide real-time updates to passengers, and optimize service routes.

Highway Safety

Weigh station bypass programs: Weigh station bypass is a system that identifies safe and compliant commercial vehicles on the highway, allowing them to bypass weigh stations and inspection sites.

a. **PrePass**:
    i. RFID Transponders and infrastructure: Uses the 902-928 MHz spectrum for communication between trucks and weigh stations to improve safety and efficiency for state enforcement agencies and the trucking industry.

b. Oregon Department of Transportation
    i. RFID Transponders and infrastructure: Uses the 902-928 MHz spectrum for communication between trucks and weigh stations to improve safety and efficiency for state enforcement agencies and the trucking industry.

c. Washington Department of Transportation
    i. RFID Transponders and infrastructure: Uses the 902-928 MHz spectrum for communication between trucks and weigh stations to improve safety and efficiency for state enforcement agencies and the trucking industry.

d. South Dakota Department of Transportation
    i. RFID Transponders and infrastructure: Uses the 902-928 MHz spectrum for communication between trucks and weigh stations to improve safety and efficiency for state enforcement agencies and the trucking industry.

e. Idaho Transportation Department
    i. RFID Transponders and infrastructure: Uses the 902-928 MHz spectrum for communication between trucks and weigh stations to improve safety and efficiency for state enforcement agencies and the trucking industry.

Railroads

a. **Union Pacific Railroad**:
    i. Positive Train Control (PTC): Uses the 902-928 MHz spectrum for communication between trains and control centers to enhance safety and prevent accidents.

b. **BNSF Railway**:
    i. Asset Tracking: Employs RFID systems operating in the 900 MHz band to track railcars, locomotives, and other equipment throughout their network.

c. **CSX Transportation**:
    i. Remote Monitoring: Uses wireless sensors in the 902-928 MHz range to monitor track conditions and train components for maintenance and safety purposes.

Tolling Authorities

31 State Toll Authorities use tags and transponders that communicate in the Lower 900Mhz Spectrum with overhead readers to identify the vehicle owner and automatically charge tolls to the proper account.

Airlines

a. **Southwest Airlines**:
    i. Baggage Tracking: Utilizes RFID technology in the 900 MHz band to track passenger luggage, ensuring accurate and efficient baggage handling.

b. **American Airlines**:
    i. Cargo Management: Uses RFID systems operating in the 902-928 MHz spectrum to monitor and manage cargo shipments, improving logistics and reducing losses.

c. **Delta Air Lines**:
    i. Equipment Tracking: Employs RFID technology to track ground support equipment and maintenance tools, enhancing operational efficiency.

Shipping and Logistics

a. **FedEx**:
    i. Package Tracking: Uses RFID technology in the 900 MHz band to track packages throughout their shipping network, ensuring timely deliveries and reducing lost items.
b. **UPS**:
    i. Fleet Management: Utilizes wireless communication in the 902-928 MHz range for vehicle tracking and telematics, optimizing route planning and improving delivery efficiency.
c. **DHL**:
    i. Warehouse Automation: Implements RFID systems operating in the 900 MHz band to automate inventory management and tracking in their warehouses and distribution centers.

Public Transportation

a. **New York City Transit Authority (MTA**):
    i. Bus and Train Tracking: Uses the 902-928 MHz spectrum for real-time tracking of buses and trains, providing accurate arrival times and improving service reliability.
b. **Chicago Transit Authority (CTA**):
    i. Passenger Information Systems: Employs wireless communication in the 900 MHz band to provide real-time updates on bus and train locations and schedules to passengers.
c. **Los Angeles Metro**:
    i. Automated Fare Collection: Uses RFID technology in the 902-928 MHz range for contactless fare payment systems, improving the efficiency of fare collection and reducing wait times.

Trucking and Fleet Management

a. **J.B. Hunt Transport Services**:
    i. Telematics: Utilizes the 900 MHz band for vehicle tracking and telematics, enabling real-time monitoring of fleet operations and improving route optimization.
b. **Schneider National**:
    i. Asset Management: Uses RFID systems operating in the 902-928 MHz spectrum to track trailers, containers, and other assets, enhancing logistics efficiency.
c. **Swift Transportation**:
    i. Driver Safety Monitoring: Employs wireless communication in the 900 MHz band for monitoring driver behavior and ensuring compliance with safety regulations.

Ports and Terminals

a. **Port of Los Angeles**:
    i. Container Tracking: Uses RFID technology in the 902-928 MHz range to track shipping containers, improving the efficiency of cargo handling and reducing delays.
b. **Port of Long Beach**:
    i. Equipment Monitoring: Employs wireless sensors operating in the 900 MHz band to monitor the condition and location of port equipment, enhancing maintenance and operational efficiency.
c. **Port of Miami**:
    i. Automated Gate Systems: Uses RFID systems in the 902-928 MHz spectrum for automated entry and exit of trucks and containers, speeding up the processing time at the gates.

Utilities:

a. Itron: Provides smart metering solutions like the OpenWay Riva meters, which use the 902-928 MHz frequency band for **Advanced Metering Infrastructure (AMI).** This allows utilities to remotely collect consumption data, detect outages, and manage energy distribution more effectively.

b. Sensus: Utilizes the FlexNet communication network operating in the 900 MHz band for **smart water, gas, and electric meters**. This system supports long-range communication and provides utilities with detailed usage data, enhancing operational efficiency.

Retail and Logistics:

a. **Walmart**: Uses Zebra Technologies RFID solutions in their distribution centers and stores. The RFID tags on products and pallets communicate with readers using the 902-928 MHz band, enabling real-time inventory tracking, reducing out-of-stock situations, and improving supply chain efficiency.

b. **Amazon**: Implements RFID technology through Impinj systems for inventory management in their fulfillment centers. RFID readers placed throughout the warehouses scan tags on products to ensure accurate stock levels and efficient order processing.

c. **Delta Air Lines**: Delta uses Zebra's RFID tags to track luggage, ensuring that passengers' bags are accurately monitored and delivered.

d. **Tesla**: Tesla employs Zebra Technologies RFID solutions to manage parts and components in their manufacturing facilities. This ensures that the right parts are available at the right time, improving production efficiency and reducing downtime.

e. **USPS** (United States Postal Service): The USPS uses Zebra RFID solutions to track mail and packages. By tagging items with RFID and using Zebra's readers, they can improve delivery accuracy and speed up the sorting process.

f. **ConAgra** Brands: ConAgra Brands uses Zebra Technologies RFID solutions to manage inventory and track products throughout their supply chain. This helps ensure food safety and traceability from production to the retail shelf.

g. **Lockheed Martin**: Aerospace and Defense: Lockheed Martin uses Zebra's RFID technology for asset tracking and inventory management in their manufacturing and maintenance operations.

h. Here are some more examples of companies that utilize Zebra's RFID systems: **Macy's, Ford Motor Company, Boeing, General Electric (GE), Kroger, UPS, Caterpillar Inc., Johnson & Johnson, PepsiCo, Disney, ExxonMobil, Anheuser-Busch, Tyson Foods, Harley-Davidson, CVS Health, Walgreens, Halliburton, Chevron, Bristol-Myers Squibb, General Motors (GM), Costco, Pfizer, 3M, Dell Technologies, Best Buy, Procter & Gamble (P&G), FedEx, Lowe's, Coca-Cola, Target** etc.

Agriculture:

a. **John Deere:** Uses the Field Connect soil moisture monitoring system, which employs wireless sensors operating in the 900 MHz band. These sensors provide farmers with real-time soil moisture data, enabling precise irrigation management to optimize water usage and crop yield.

b. **AgSense:** Offers the AgSense ICON irrigation management system, which uses 900 MHz wireless technology to connect field sensors and control irrigation pivots. This system allows farmers to remotely monitor and adjust irrigation schedules based on real-time field conditions.

Healthcare:

a. **GE Healthcare**: Implements the Carescape telemetry system that operates in the 902-928 MHz band for wireless patient monitoring. This system allows continuous monitoring of vital signs such as heart rate and oxygen levels, providing real-time data to healthcare providers.

b. **Philips Healthcare**: Uses the IntelliVue Telemetry System, which employs the 900 MHz frequency range for transmitting patient data wirelessly within a hospital. This system ensures continuous monitoring of patients' health, even when they are mobile within the facility.

c. **Real-Time Location Systems (RTLS) for Asset Tracking**

    ii. **Stanford Health Care**:

        1. **Asset Tracking**: Uses RTLS with 900 MHz RFID technology to track critical medical equipment such as IV pumps, wheelchairs, and defibrillators, ensuring they are available when needed and reducing time spent searching for equipment.

d. **Patient Tracking and Safety**

    iii. **Massachusetts General Hospital**:

        1. **Patient Monitoring**: Implements RFID wristbands operating in the 902-928 MHz band for patient identification and location tracking within the hospital. This enhances patient safety by ensuring accurate medication administration and reducing the risk of patient misidentification.

e. **Inventory Management**

    iv. **Cleveland Clinic**:

        1. **Pharmacy Inventory**: Uses 900 MHz RFID tags to manage pharmaceutical inventory. This system helps maintain accurate stock levels, reduces waste due to expired medications, and ensures critical medications are always available.

f. **Staff Monitoring and Efficiency**

    v. **Mayo Clinic**:

        1. **Staff Workflow Optimization**: Utilizes RTLS with 902-928 MHz RFID technology to monitor the location and movement of healthcare staff. This data helps optimize workflows, improve staff allocation, and reduce patient wait times.

g. Infant Protection System**s**

    vi. **Johns Hopkins Hospital**:

        1. **Infant Security**: Employs infant protection systems using RFID tags in the 900 MHz band to prevent infant abductions. These tags trigger alarms if an infant is moved to an unauthorized area.

h. **Environmental Monitoring**

    vii. **Kaiser Permanente**:

        1. **Temperature and Humidity Monitoring**: Uses wireless sensors operating in the 902-928 MHz range to monitor and control the temperature and humidity levels in storage areas for medications and vaccines, ensuring they are kept in optimal conditions.

i. **Blood and Tissue Tracking**

    viii. **American Red Cross**:

        1. **Blood Product Tracking**: Implements RFID technology in the 900 MHz band to track blood products from donation through processing to delivery. This system ensures traceability, reduces errors, and improves inventory management.

j. **Medical Device Management**

    ix. **Medtronic**:

        1. **Device Tracking**: Uses RFID tags operating in the 902-928 MHz band to manage and track medical devices and implants. This ensures that devices are correctly matched to patients and reduces the risk of lost or misplaced items.

k. **Operating Room Management**

    x. **Mount Sinai Health System**:

        1. **Surgical Instrument Tracking**: Employs 900 MHz RFID systems to track surgical instruments in real-time during procedures. This helps ensure all instruments are accounted for before, during, and after surgeries, reducing the risk of retained surgical items.

l. **Hand Hygiene Compliance**

    xi. **Cedars-Sinai Medical Center**:

        1. **Hand Hygiene Monitoring**: Utilizes RFID technology in the 902-928 MHz range to monitor and improve hand hygiene compliance among healthcare workers, reducing the risk of healthcare-associated infections (HAIs).

m. **Patient Temperature Monitoring**

    xii. **Texas Children's Hospital**:

    xiii. **Continuous Temperature Monitoring**: Uses wireless sensors operating in the 902-928 MHz band to continuously monitor patient body temperatures, particularly in neonatal intensive care units (NICUs). This ensures prompt detection of temperature fluctuations and timely intervention.

n. **Medication Dispensing Systems**

    xiv. **Beth Israel Deaconess Medical Center**:

        1. **Automated Medication Dispensing**: Implements RFID-enabled medication dispensing systems operating in the 900 MHz band. These systems ensure accurate dispensing of medications, reduce human errors, and enhance patient safety.

Industrial Automation:

a. **Honeywell**: Provides the XYR 6000 wireless transmitters that use the 900 MHz band to monitor and control industrial processes. These transmitters collect data from various sensors and transmit it to a central control system, enabling real-time monitoring and optimization of operations.

b. **Emerson**: Offers the WirelessHART technology, which operates in the 902-928 MHz range. This system connects wireless sensors and actuators in industrial environments, allowing for flexible and reliable monitoring and control of processes.

c. **Automated Guided Vehicles (AGVs) and Robots**

    a. **General Motors (GM)**:

        i. **Factory Automation**: Uses AGVs and robots operating with wireless communication in the 902-928 MHz band for material handling and assembly tasks. This enhances production efficiency and reduces manual labor.

d. **Machine-to-Machine (M2M) Communication**

    a. **Caterpillar Inc.**:

        i. **Construction Equipment**: Employs M2M communication using the 900 MHz band to allow construction machinery to communicate with each other and with central control systems, optimizing operations and improving safety.

e. **Remote Monitoring and Control**

    a. **ExxonMobil**:

        i. **Oil and Gas Operations**: Uses wireless sensors operating in the 902-928 MHz range to remotely monitor and control various aspects of oil and gas extraction and processing, improving safety and efficiency.

f. **Wireless Sensor Networks (WSNs)**

    a. **Siemens**:

        i. **Industrial Automation**: Implements WSNs using the 900 MHz band for monitoring temperature, pressure, and other critical parameters in manufacturing processes. This ensures real-time data collection and process optimization.

g. **Predictive Maintenance**

    a. **Boeing**:

      - i. **Aircraft Manufacturing**: Uses 900 MHz RFID tags and wireless sensors to monitor the condition of machinery and equipment, predicting maintenance needs before failures occur, thus reducing downtime.

- h. **Industrial IoT (IIoT)**
  - a. **Honeywell**:
    - i. **Smart Manufacturing**: Uses IIoT devices operating in the 900 MHz spectrum to connect various machinery and systems, enabling real-time data analytics and process optimization.
- i. **Safety Systems**
  - a. **Dow Chemical**:
    - i. **Hazardous Environment Monitoring**: Uses wireless communication in the 900 MHz band for safety systems that monitor gas leaks and other hazardous conditions, providing real-time alerts to ensure worker safety.
- j. **Energy Management**
  - a. **Schneider Electric**:
    - i. **Smart Grids**: Employs 900 MHz wireless communication to manage and control energy distribution in smart grids, optimizing energy use and reducing costs.
- k. **Process Control Systems**
  - a. **Procter & Gamble (P&G)**:
    - i. **Manufacturing Processes**: Uses wireless sensors operating in the 902-928 MHz range for real-time monitoring and control of manufacturing processes, ensuring product quality and reducing waste.
- l. **Forklift and Vehicle Tracking**
  - a. **PepsiCo**:
    - i. **Warehouse Operations**: Utilizes RFID systems in the 900 MHz band to track the location and movement of forklifts and other vehicles within warehouses, improving efficiency and safety.
- m. **Inventory Management**
  - a. **3M**:
    - i. **Manufacturing Plants**: Implements RFID technology in the 902-928 MHz range to manage inventory levels of raw materials and finished products, ensuring accurate stock levels and reducing downtime.
- n. **Environmental Monitoring**
  - a. **Tesla**:

        i. **Battery Manufacturing**: Uses wireless sensors in the 902-928 MHz band to monitor environmental conditions such as temperature and humidity in battery manufacturing facilities, ensuring optimal production conditions.

o. **Quality Control**

    a. **Intel**:

        i. **Semiconductor Manufacturing**: Employs wireless communication in the 900 MHz band for quality control systems that monitor the production of semiconductors, ensuring high product standards.

p. **Remote Equipment Diagnostics**

    a. **John Deere**:

    b. **Agricultural Equipment**: Uses 900 MHz wireless systems for remote diagnostics and troubleshooting of agricultural machinery, reducing downtime and improving maintenance efficiency.

q. **Automated Meter Reading (AMR)**

    a. **Duke Energy**:

        i. **Utility Management**: Implements AMR systems operating in the 902-928 MHz range to automatically collect data from utility meters, improving accuracy and reducing the need for manual readings.

Home Automation:

a. **SmartThings**: Uses the Z-Wave protocol, which operates in the 900 MHz band for certain smart home devices. This protocol connects devices like security sensors, smart plugs, and lighting controls, enabling users to automate and control their homes remotely.

b. **Vivint**: Employs the 902-928 MHz band for its wireless home security systems. Devices such as door/window sensors, motion detectors, and smart locks communicate over this frequency, providing comprehensive home security and automation solutions.

c. **Wireless Sensors**:

    a. Door and Window Sensors: These sensors use the 902 to 928 MHz band to communicate with the home automation hub, providing real-time status updates on whether doors or windows are open or closed.

    b. Motion Detectors: Motion sensors operating in this band can detect movement within a home and trigger alarms or notifications, enhancing security.

d. **Smart Lighting**:

    a. Remote Control of Lights: Smart lighting systems use this frequency band to allow homeowners to control lights remotely via a smartphone app or voice commands. This includes turning lights on or off, dimming, and setting schedules.

e. **Thermostats and HVAC Control**:

    a. **Smart Thermostats**: Thermostats operating in the 902 to 928 MHz band can communicate with other smart devices to optimize heating and cooling based on occupancy and user preferences.
    b. **HVAC System Monitoring**: These systems can monitor and control HVAC systems, ensuring optimal performance and energy savings.

f. **Appliance Control**:
    a. **Smart Plugs and Outlets**: These devices use the 902 to 928 MHz band to enable remote control of appliances, allowing users to turn devices on or off and monitor energy usage.
    b. **Automated Appliance Scheduling**: Home automation systems can schedule appliances to operate at specific times, improving convenience and energy efficiency.

Environmental Monitoring:

g. **Davis Instruments**: Offers the Vantage Pro2 weather stations, which use 900 MHz frequencies for wireless communication between sensors and the console. These stations provide accurate weather data, including temperature, humidity, wind speed, and rainfall, for environmental monitoring.

h. **Libelium**: Provides the Waspmote wireless sensor platform, operating in the 900 MHz band. This platform supports various environmental sensors to monitor air quality, soil moisture, and other parameters, transmitting data wirelessly for analysis and decision-making.

i. **Weather Forecasting and Monitoring**: Wind profiler radars (WPR) operating in this band are used for short-term weather forecasting, monitoring wind speed and direction at various altitudes, and providing severe weather warnings for aviation.

j. **Air Pollution Monitoring**: This frequency band supports systems that analyze wind fields and forecast the trajectories of toxic plumes resulting from chemical or nuclear incidents.

k. **Meteorological Observations**: The band is used for general meteorological observations, including monitoring atmospheric conditions and climate evolution.

l. **Airport Operations**: Systems operating in this band help in monitoring weather conditions at airports, ensuring safe and efficient airport operations.

m. **Public Protection**: The band is also utilized for public protection by providing early warnings and monitoring environmental hazards

Security:

a. **ADT**: Uses the 900 MHz band for its wireless alarm systems, such as the ADT Pulse system. This system connects sensors, cameras, and control panels wirelessly, allowing users to monitor and control their home security remotely.

b. **SimpliSafe**: Employs the 902-928 MHz band for its wireless security devices, including entry sensors, motion detectors, and glass break sensors. These devices communicate with the base station to provide a comprehensive security solution.

c. **Perimeter Protection**:

    a. **Military Bases**: Security systems operating in this band are deployed around military bases to detect unauthorized intrusions. These systems use radar and other sensors to monitor the perimeter continuously, providing real-time alerts to security personnel.

    b. **Critical Infrastructure**: Facilities such as power plants and water treatment facilities use these systems to secure their perimeters. The systems can detect and track intruders, even in challenging environments like dense foliage or adverse weather conditions.

d. **Intrusion Detection**:

    a. **High-Security Areas**: In areas requiring high security, such as government buildings and research labs, intrusion detection systems in this band are used to monitor access points and sensitive zones. These systems can detect unauthorized entry and trigger alarms, ensuring immediate response.

    b. **Residential Security**: Advanced home security systems also utilize this frequency band to detect intrusions. These systems can integrate with smart home devices, providing homeowners with alerts and the ability to monitor their property remotely.

e. **RFID Systems**:

    a. **Logistics and Supply Chain**: RFID systems operating in the 902 to 928 MHz band are used to track and monitor assets such as shipping containers, vehicles, and equipment. This enhances security by ensuring that assets are accounted for and not tampered with during transit.

    b. **Port Security**: Ports use RFID systems to monitor the movement of goods and vehicles. This helps in preventing theft and ensuring that only authorized personnel have access to restricted areas1.

f. **Surveillance Radar**:

    a. **Drone Detection**: Surveillance radar systems in this band are used to detect and track drones, which can pose security threats to both civilian and military facilities. These systems can identify the position and movement of drones, allowing for timely countermeasures.

    b. **Border Security**: Countries use surveillance radar systems to monitor their borders for illegal crossings and smuggling activities. These systems can cover large areas and provide continuous monitoring, enhancing national security.

Telecommunications:

a. **Cambium Networks**: Offers the ePMP 1000 series, which provides fixed wireless access in the 900 MHz band. This technology delivers reliable broadband connectivity to rural and underserved areas, supporting internet access and communication services.

b. **Ubiquiti Networks**: Uses the 900 MHz frequency range for their airMAX wireless broadband solutions. These systems provide high-speed internet connectivity in remote and challenging environments, bridging the digital divide in underserved regions.

c. **Wireless Internet Service Providers (WISPs)**:

    a. **Rural Broadband**: WISPs use this frequency band to provide broadband internet access in rural and underserved areas. The 902 to 928 MHz band offers good propagation characteristics, allowing signals to cover longer distances and penetrate obstacles like trees and buildings.

d. **Mesh Networks**:

    a. **Smart City Infrastructure**: Mesh networks operating in this band are used to connect various smart city devices, such as traffic lights, surveillance cameras, and environmental sensors. These networks provide reliable and scalable communication solutions for urban infrastructure.

e. **Amateur Radio**:

    a. **Local Communications**: Amateur radio operators use this band for local communications, experimenting with different modes and technologies. This band is particularly popular for short-range communications and digital modes.

Wireless Protocols:

f. **LoRaWAN (Long Range Wide Area Network)**:

    a. Description: LoRaWAN is a low-power, wide-area networking protocol designed for IoT applications. It operates in the 902 to 928 MHz band in North America, providing long-range communication with low power consumption.

    b. Applications: It's used for smart city infrastructure, agricultural monitoring, and industrial IoT applications.

g. **Zigbee**:

    a. Description: Zigbee is based on the IEEE 802.15.4 standard and operates in the 902 to 928 MHz band in North America. It is designed for low-power, low-data-rate communication.

    b. Applications: Commonly used in home automation, smart lighting, and industrial control systems.

h. **Sigfox**:

    a. Description: Sigfox is a low-power, wide-area network (LPWAN) protocol that operates in the 902 to 928 MHz band in the United States. It is designed for simple, low-cost IoT applications.

    b. Applications: Used for asset tracking, environmental monitoring, and smart metering.

i. **WirelessHART:**

    a. Description: WirelessHART is an industrial wireless protocol that operates in the 902 to 928 MHz band. It is based on the HART Communication Protocol and is designed for industrial process automation.

    b. Applications: Used in industrial environments for monitoring and controlling processes.

j. **MiWi:**

a. Description: MiWi is a proprietary wireless protocol developed by Microchip Technology. It operates in the 902 to 928 MHz band and is designed for low-power, low-data-rate communication.

b. Applications: Used in home automation, smart energy, and industrial control systems.